USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002TN5B

Title: Water Quality monitoring in two 303(d)-listed East Tennessee streams

Project Type: Research

Focus Categories: Geomorphological Processes, Sediments, Methods

Keywords: water quality monitoring, land-water interactions, urban hydrology, suspended sediments, streams, runoff, geomorphology

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds Requested: $9,498

Non-Federal Matching Funds Requested: $20,531

Congressional District: TN2

Principal Investigator:
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Abstract

A critical problem for Tennessee is that of obtaining sufficient information about the quality of the state?s streams and rivers in order to identify and remediate water quality, as required by law and by court order. Sediment, the most common pollutant in Tennessee streams, poses special challenges because different accepted methods for monitoring sediment may not yield comparable results. Objectives of the proposed research are to (1) provide new water quality data for Third Creek, in Knoxville, Tennessee, and for a 303(d)-listed tributary to the Little River in Blount County, Tennessee, (2) compile and analyze existing water quality records for Third Creek in order to improve understanding of the nature and timing of pollutant loading, (3) compare results of suspended sampling by different methods and test the Chemical Perturbation Index as a way of maximizing the information derived from simple chemical analyses, and (4) involve 35-40 University of Tennessee students in water quality monitoring and in thinking about issues associated with watershed management and water quality.

The research will involve a large group of students (35-40) in regular and storm monitoring of Third Creek in March and April, 2002, and it will also support baseline and storm monitoring on a tributary of the Little River during the spring and early summer months. After the spring semester has ended, a graduate student and an undergraduate student will continue the monitoring, including lab work, and will compile and analyze all data from the two streams. Monitoring of Third Creek will continue for one year (March ? February). Students will monitor discharge, dissolved oxygen, sediment, nitrogen, phosphates, copper, chromium, pH, temperature, turbidity, calcium/hardness, conductivity, and coliform bacteria concentration. They will also observe and document the aggraded or eroded status of the stream channel, measure the size of channel bed sediment, and record characteristics of the nearby riparian zone. We will fabricate and install rising stage samplers to help capture sediment and flow elevation during storm events as part of the monitoring effort. Site-specific records along the creek will enable us to pinpoint problem areas and link water quality issues to land use in the contributing watershed.

The proposed research provides new data and fills the need to round up, combine, and analyze all available data for Third Creek. Results of this research should help inform decisions regarding TMDLs in East Tennessee streams, and are expected to yield one M.S. thesis and one methodology-oriented published paper. The proposed research will help train a group of undergraduate and graduate students, provide more intense training for two students who participate over the year of research, and stimulate collaborative interactions among groups with a stake in these watersheds.